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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,221	04/02/2004	Takayuki Nakamoto	43888-310	7325

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MCDERMOTT, WILL & EMERY
600 13th Street, N.W.
WASHINGTON, DC 20005-3096

EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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12/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/816,221	Applicant(s) NAKAMOTO ET AL.	
	Examiner Tony Chuo	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/11/07 has been entered.

Response to Amendment

2. Claims 1-4 and 6-12 are currently pending. Claim 5 is cancelled. New claims 10-12 have been added. In light of the terminal disclaimer that was filed on 10/11/07, the previously stated provisional double patenting rejections are withdrawn. The amended claims do overcome the previously stated 103 rejection. However, upon further consideration, claims 1-4 and 6-12 are rejected under the following new 112, 102, and 103 rejections.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 10-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "wherein the negative electrode active material does not include a carbon layer" is not supported by the specification.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 2, 4, and 6-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Kawase et al (US 2004/0142242).

Regarding claims 1, 2, 6, 7, and 9-12, the Kawase reference discloses a lithium secondary battery using a negative electrode capable of absorbing/desorbing lithium comprising: an anode active material layer "22B" comprising an alloy such as TiSi_2 , MoSi_2 , CoSi_2 , NiSi_2 , FeSi_2 , MnSi_2 , VSi_2 , and WSi_2 ; and a surface layer "22C" comprising silicon oxide of 50 nm in thickness formed on the anode active material layer, wherein

the active material is mainly composed of Si and does not include a carbon layer (See paragraphs [0026],[0027],[0029]).

Regarding claim 4, it is inherent that the silicon oxide film formed by deposition or sputtering method would have a thickness in the range of $\pm 50\%$ of the average thickness since it is well known in the art that the deposition process forms a very uniform layer (See paragraph [0038]).

Regarding claim 8, it also discloses an anode active material layer that is made of amorphous silicon (See paragraph [0048]).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4 and 6-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al (JP 2002/075332) in view of Yamamoto et al (US 2003/0054249).

The Fukui reference discloses a lithium secondary battery using a negative electrode active material capable of absorbing/desorbing lithium comprising: a layer "12" comprising an alloy containing Si and Ni or Cu such as Si₉Ni or Si₉Cu alloy powders, wherein the active material is mainly composed of Si and does not include a carbon layer (See paragraphs [0034],[0035]).

However, Fukui et al does not expressly teach a surface layer comprising silicon oxide of 0.2 to 1,000 nm in average thickness formed on the inner layer, wherein the average thickness of the surface layer is 1 to 100 nm, wherein the average thickness of the surface layer is 1 to 10 nm, wherein the surface layer has a thickness in the range of $\pm 50\%$ of the average thickness; and a negative electrode active material that includes an amorphous Si phase. The Yamamoto reference discloses a silicon oxide film "5b" that is formed on an anode layer "3b", wherein the silicon oxide film has a thickness of 1.6 nm and the anode layer comprises an amorphous silicon (See paragraph [0100],[0101], [0105]). Examiner's note: it is inherent that the silicon oxide film formed by vapor deposition would have a thickness in the range of $\pm 50\%$ of the average thickness since it is well known in the art that the vapor deposition process forms a very uniform layer (See paragraph [0101]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Fukui battery to include a surface layer comprising silicon oxide formed on the inner layer, wherein the surface layer has a thickness of 1.6 nm, and wherein the surface layer has a thickness in the range of $\pm 50\%$ of the average thickness; and a negative electrode active material that includes an amorphous Si phase in order to reduce an anode potential during discharging that results in an increase in a battery operating voltage and to reduce the hydrofluoric acid level in the electrolyte which decreases the resistance within the battery by preventing positive ions in the cathode from eluting or LiF from forming on the anode surface excessively (See paragraphs [0093],[0100],[0111]).

Response to Arguments

9. Applicant's arguments, see Remarks, filed 10/11/07, with respect to the rejection(s) of claim(s) 1-4 and 6-9 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new ground(s) of rejection are made in view of Kawase et al, Fukui et al, and Yamamoto et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 7:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC



JONATHAN CREPEAU
PRIMARY EXAMINER